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# The microstructure of the euro money market

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## Abstract

This paper provides an empirical examination of the microstructure of the euro money market, especially the overnight market, the interbank market for short-term funds in the transnational currency created in January 1999. The institutional framework shaping the microstructure of the money market can be delimited as the union of: (1) central banks' interest-setting bodies and their long-term policy strategy; (2) instruments for monetary policy operations and liquidity management; (3) the private market financial instruments and trading mechanisms for funds; and, (4) the payment and settlement infrastructure for the transfer of those funds. All four elements can significantly influence the intraday behaviour of money market rates. To study their effects on the euro money market, 5 months of intraday data for overnight deposits have been recorded from brokers in four euro area countries and the UK (posting their quotes on Reuters) and from the Italian electronic market MID. The results show “two-hump” shaped (or “u”-shaped) intraday patterns of quoting frequency and volatility, but flatter intraday patterns (sometimes weakly single “hump”-shaped) for bid-ask spreads. Even intraday overnight rate levels hardly differ across brokers located in different euro area countries, reflecting the high integration of this market already shortly after the introduction of the euro, despite some remaining heterogeneities in market structures and trading channels. Quoting activity, rate volatility and spreads increase on ECB Governing Council days, particularly after the 1.45 pm release time of interest rate decisions. However, since the amplitude of this volatility is economically small and since turnovers are not indicative of adverse selection, the average degree of policy uncertainty seems to have been rather limited during our sample period. ECB announcements of new M3 data, related to the first pillar of its monetary policy strategy, around 10am seem to be associated with very moderate increases in short-term volatility. Tuesdays' Eurosystem main refinancing auctions with the open market exhibit active pre- and post-auction liquidity re-allocation, but only a very short and moderate increase in volatility after the announcement of the allotments and no signs of market power or adverse selection. Open market operation settlement days exhibit the highest turnovers during the busi-

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ness week, at least for the MID, without, however, being affected by any special risks. Finally, it is shown that spreads and volatility tend to be very high at the end of the minimum reserve maintenance period and that the same happened during the year 2000 changeover days, reflecting the high risks involved in both. © 2001 Elsevier Science Ltd. All rights reserved.

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## 1. Introduction

This paper presents the first broad empirical examination of the euro money market's microstructure. In contrast to other financial markets, such as bond, equity or foreign exchange markets, there is only a small amount of literature touching upon microstructure issues of the money market. In particular, papers addressing intraday features of this market are extremely rare. To our knowledge only Angelini (2000; for the Italian electronic deposit market before the introduction of the euro) and Furfine (1999; for the US fed funds market) have presented empirical papers on the intraday behaviour of money markets. Angelini focuses on the implications risk aversion has on Italian banks' intraday timing of overnight transactions when periods of uncertainty about liquidity needs are determined by institutional features of the payment system. Furfine describes the size, concentration and intraday timing of the fed funds market and analyses bank relationship patterns in it with special consideration of institutions' sizes.<sup>1</sup>

Some theoretical work by Bhattacharya and Gale (1987) and Bhattacharya and Fulghieri (1994) has explained the existence of private interbank markets for short-term funds with the need by banks to "re-insure" against idiosyncratic liquidity shocks coming from their retail depositors. More recent theoretical work has addressed the issue whether this type of interbank liquidity insurance causes systemic risk in the banking system (see De Bandt and Hartmann, 2000, for a survey). Finally, Freixas and Holthausen (2001) started to study the working of international money markets, when information about foreign banks is asymmetric. This theoretical interbank market literature in general does not tackle the role of regular monetary policy, central bank operations and regulations in money markets.

However, there is an earlier literature that relates the behaviour of overnight interbank market rates by a representative bank to monetary policy operational pro-

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<sup>1</sup> Most other empirical papers on money markets follow a traditional macroeconomic approach or look at the time series properties of short rates at a daily (or longer) frequency (see e.g. Spindt and Hoffmeister, 1988; Griffiths and Winters, 1995; Hamilton, 1996 for the US fed funds market and Perez-Quiros and Rodriguez, 2000, as well as Bindseil and Seitz, 2001, who recently started such work for the euro overnight market).

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